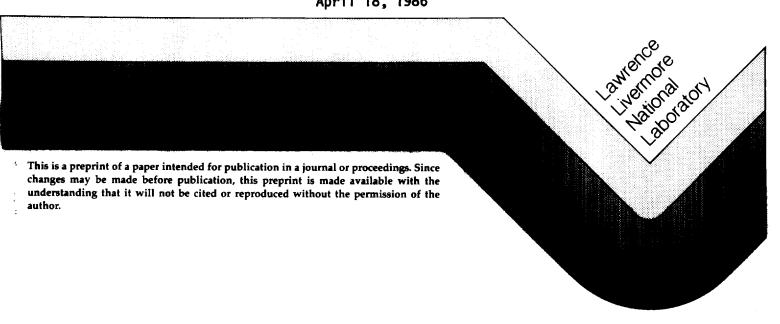# THE Be-Tc (BERYLLIUM-TECHNETIUM) SYSTEM

H. Okamoto
L. E. Tanner

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Lawrence
Livermore
National
Laboratory

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The Be-Tc (Beryllium-Technetium) System
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By H. Okamoto and L.E. Tanner
Lawrence Livermore National Laboratory

Equilibrium Diagram

[67Buc] reported that the superconducting transition temperature of
Be$_{22}$Tc is 5.21 K. No other compounds have been found to date.

The melting point of βBe and the βBe --> αBe allotropic transformation
temperature are 1289$\pm$4 and 1270$\pm$6 °C, respectively [85BAP]. The melting
point of Tc is 2204$\pm$50 °C [81BAP].

Crystal Structures

A summary of crystal structure and lattice parameter data is given in
Table 1. The crystal structure of Be$_{22}$Tc is assumed to be the same as
that of Be$_{22}$Re [85Oka].

[80Tan] predicted the possible existence of a stable or metastable
compound, BeTc, having CsCl-type crystal structure from the study of a
series of alloys based on Be.

Cited References

67Buc: E. Bucher and C. Palmy, "Superconductivity and Isotope Effect in
Be$_{22}$X Compounds and Molybdenum," *Phys. Lett.*, 24A(7), 340-341 (1967).
(Equi Diagram; Experimental)

80Tan: L.E. Tanner, "The Stable and Metastable Phase Relations in the
Hf-Be Alloy System," *Acta Metall.*, 28(12), 1805-1816 (1980). (Crys
Structure; Theory)

81BAP: "Melting Points of the Elements", *Bull. Alloy Phase Diagrams*,
2(1), 145-146 (1981). (Equi Diagram; Compilation)

81Kin: H.W. King, "Crystal Structures of the Elements at 25 °C", *Bull.*
Alloy Phase Diagrams, 2(3), 401-402 (1981). (Crys Structure;
Compilation)

82Kin: H.W. King, "Temperature-Dependent Allotropic Structures of the
Elements", *Bull. Alloy Phase Diagrams*, 3(2), 275-276 (1982). (Crys
Structure; Compilation)

85BAP: to be published in *Bull. Alloy Phase Diagrams* (1985). (Equi
Diagram; Compilation)

85Oka: H. Okamoto and L.E. Tanner, "The Be-Re (Beryllium-Rhenium) System," to be published in <u>Bull. Alloy Phase Diagrams</u> (1985). (Equi Diagram; Review)

Table 1   Be-Tc Crystal Structure and Lattice Parameter Data

Phase	Composition, at.% Tc	Pearson symbol	Struktur-bericht designation	Space group	Proto-type	Lattice parameters, nm a	c	Reference
(βBe)....	0	cI2	A2	I m3m	W	0.25515	...	[82Kin]
(αBe)....	0	hP2	A3	P6$_3$/mmc	Mg	0.22857	0.35839	[81Kin]
Be$_{22}$Tc...	4.3	cF184	...	Fd3m	Zn$_{22}$Zr	?	...	(a)
(Tc).....	100	hP2	A3	P6$_3$/mmc	Mg	0.2738	0.4394	[81Kin]

(a) Analogy to Be$_{22}$Re is assumed.

Acknowledgments